THE

VETERINARY JOURNAL

Editor :

FREDERICK HOBDAY, C.M.G., F.R.C.V.S., F.R.S.E.,

HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING.
OFFICIER DU MERITE AGRICOLE (FRANCE).
CAVALIERE DEI S. S. MAURIZIO E LAZZARO (ITALY).
HONORARY MEMBER OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.
AND FORMERLY PROFESSOR IN THE ROYAL VETERINARY COLLEGE, LONDON.

Sub-Editor :

GLADSTONE MAYALL, M.R.C.V.S.

SEPTEMBER, 1921.

Editorials.

THE TUBERCULOSIS-FREE ACCREDITED HERD SYSTEM.

THE method of an official list of tuberculosis-free accredited herds as a semi-voluntary effort on the part of owners, boosted up by Government support, has made excellent progress in the United States, where the Bureau of Animal Industry gave the scheme its blessing in 1917; and it is to the veterinary staff that the credit of the idea is due. It is a plan for assisting the owner of a pure bred herd to get rid of tuberculosis, if it is present; and when he has done so to give him the advantage of having his herd placed on an official list of tuberculosis-free or "accredited" herds. In the United States the list has already several hundreds of such, and the idea has "caught on."

Canada is now falling into line, and in his annual reports for 1920 and 1921 (which have just come to hand) the Veterinary Director-General (Dr. Frederick Torrance, B.A., D.V.Sc.) urges the necessity for the adoption of the scheme if Canada does not wish to lose its place in the sale of pure bred stock to the American market.

It is interesting to read the regulations drawn up for the furtherance of this scheme, and it is time, with an estimate of at least a million

tuberculosis dairy cattle in Great Britain, that the Government of this country awakened to a sense of its responsibility in this direction. If any lethal agent other than tuberculosis milk was sold for human consumption the outcry of popular opinion would be so great that legal action would have to be taken; and when it is proved by medical statistics that thousands of infants die annually of tuberculosis of bovine origin one can scarcely understand why the subject excites so little attention. It is for us, as a profession, to hammer away on every possible occasion to get the Tuberculosis of Animals Order, which had commenced to do good work, but which was temporarily suspended in 1914, put on the Statute Book again, and by doing so we can help very materially to stamp out this terrible disease from man and animals.

Writing of tuberculosis milk in Canada, Dr. Torrance says :—" In municipal testing the work is slowly extending, but not to the extent that might be expected. Municipalities do not appear to realise the advantage of the Government's offer to test dairy herds free of charge and to pay compensation for cattle slaughtered as diseased. Many cities appear to think that pasteurising the milk affords every protection. Other cities do not even take this precaution and the citizens are left to take their chances. The burden of this carelessness does not fall upon those who deserve it, but upon the poor defenceless children, many of whom are doomed to early graves or to lives of crippled misery from tubercular infection carried by the milk of diseased cows. Our first test of certain dairies sometimes reveals appalling conditions. In one dairy our inspectors found ten cows all of which reacted to the tuberculin test. When these were slaughtered, all were found diseased, some extensively. Among them were cows whose milk was loaded with tubercle bacilli. This dairy was distributing raw milk daily in the city. How many children were exposed to disease in this way is unknown, or how many contracted the disease, but there is no reason to expect that all escaped. The city in question now has a safe milk supply, as all raw milk offered for sale is derived from tuberculin tested cows."

The following are the Canadian Government Regulations of the Establishment and Maintenance of Tuberculosis-free Accredited Herds of Cattle :—

1. A tuberculosis-free accredited pure-bred herd is one which has been tuberculin tested by the subcutaneous method, or any other test approved by the Veterinary Director-General, and applied by the regularly employed veterinary inspectors of the Health of Animals Branch of the Federal Department of Agriculture. Further, it shall be a herd in which no animal affected with tuberculosis has been found

upon two annual or three semi-annual tuberculin tests, as above described, and by physical examination.

2. The entire herd, or any cattle in the herd, shall be tuberculin tested or retested at such time as is considered necessary by the Veterinary Director-General.

3. No cattle shall be presented to the tuberculin test which have been injected with tuberculin within 60 days immediately preceding or which have at any time reacted to a tuberculin test.

4. No herd shall be classed as an accredited herd in which tuberculosis has been found by the application of the test, as referred to in paragraph 1, until such herd has been successfully subjected to two consecutive tests with tuberculin, applied at intervals of not less than six months, the first interval dating from the time of removal of the tuberculous animals from the herd.

5. Prior to each tuberculin test satisfactory evidence of the identity of the registered animal shall be presented to the inspector. Any grade cattle maintained in the herd, or associated with animals of the herd, shall be identified by a tag or other markings satisfactory to the Veterinary Director-General.

6. All removals of registered cattle from the herd, either by sale, death or slaughter, shall be reported promptly to the said Veterinary Director-General, giving the identification of the animals, and, if so, the name and address of the person to whom transferred. If the transfer is made from the accredited herd to another accredited herd, the shipment shall be made only in properly cleaned and disinfected cars. No cattle shall be allowed to associate with the herd which have not passed a tuberculin test approved by the Veterinary Director-General.

7. All milk and other dairy products fed to calves shall be that produced by an accredited herd, or, if from outside or unknown sources, it shall be pasteurised by heating to not less than 150° F. for not less than 20 minutes.

8. All reasonable sanitary measures and other recommendations by the Federal authorities for the control of tuberculosis shall be complied with.

9. Cattle from an accredited herd may be shipped to the United States accompanied by the certificate of the Veterinary Director-General, without further tuberculin test for a period of one year, subject to the rules and regulations of the State of destination.

10. Strict compliance with these methods and rules shall entitle the owner of tuberculosis-free herds to a certificate, " Tuberculosis-

free Accredited Herd," to be issued by the Veterinary Director-General. Said certificate shall be good for one year from date of test unless revoked at an earlier date.

11. Failure on the part of owners to comply with the letter or spirit of these methods and rules shall be considered sufficient cause for immediate cancellation of co-operation with them by the Federal officials.

12. Whenever in carrying out this order it is necessary to slaughter an animal or animals for the eradication of tuberculosis from a herd, the animal or animals shall be valued and compensation awarded as provided in Sections 6 and 7 of the Animal Contagious Diseases Act.

Improvements in Testing.

Until recently, a subcutaneous or thermal tuberculin test has been the only one receiving general recognition, further experience with other tests, notably the intradermal, is strengthening the claims of its advocates as being of equal value. In some parts of the United States this test has been official for some time and it has certain inherent advantages which render it attractive to those in control work. It relieves the inspector of the drudgery of prolonged observation of temperature, it economises the time of inspectors, and it is not readily interfered with by accidental or intentional influences. It can also be applied frequently to the same animal without producing immunity to tuberculin.

Tuberculin testing has been going on in many herds for several years, and with the repeated injection of tuberculin in the same animals, there is grave danger of producing a condition where tuberculin will give no reaction in a diseased animal when used in the subcutaneous test. The intradermal method will cause a reaction in most of such animals, and is therefore of great value in testing herds where tuberculin has frequently been injected.

A third test, the ophthalmic, is also receiving much attention, and although not yet given the confidence of either of the other tests, is undoubtedly of value.

Combinations of two or three of these tests are now frequently used with advantage, revealing cases of tuberculosis which a single test would have failed to pick out. The branch is making use of all these methods of testing from time to time with a view to attaining the highest possible efficiency in the detection of latent or obscure cases of tuberculosis, which, if left in a herd, in process of cleaning up for accreditation, would sooner or later become "spreaders" and disseminate the disease.

REPORT ON AN ENQUIRY INTO A UNIFORM SYSTEM AND STANDARD OF MEAT INSPECTION IN SCOTLAND.*

LOCAL authorities and other representative bodies in Scotland repeatedly urged the Scottish Board of Health to establish a uniform system of meat inspection in Scotland, and in 1914 the Board issued instructions to Dr. Leighton to enquire into and report on the question. The enquiry was interrupted by the war and could not be resumed until last year.

In the first part of the report now issued, an account of the conditions presently existing throughout Scotland in respect of meat inspection is set forth. It is stated that the number of qualified inspectors in the country is quite inadequate, and many of the inspectors employed have no technical knowledge of the subject. In the counties there is no regular or reliable meat inspection. In 94 burghs out of a total of 203 the whole of the meat slaughtered is inspected, and in 86 inspection is dependent on part-time inspectors, who are only called in when required, or who visit the slaughterhouse in the intervals between other duties. In the public abattoirs there are, broadly speaking, two systems of inspection. The first is that of large centres like Edinburgh, Glasgow, Leith, etc., where the local authorities have appointed qualified veterinary surgeons for the inspection of meat, and where every carcase is inspected as it is killed or before it leaves the premises. The second is that prevalent in a larger number of public abattoirs located in places smaller than those mentioned, in which the inspector is not constantly on duty, and the usual arrangement is for the superintendent to call in the medical officer of health or veterinary inspector to pass judgment on any suspicious carcase which is observed. Meat inspection throughout the country is characterised by an extraordinary lack of system, which is not peculiar to Scotland. With the exception of two or three of the largest abattoirs, where there is a full technical staff, there is practically no system recognised as the proper procedure. This leads to careless inspection, but in many cases the absence of method and system is due to the fact that there are too few inspectors to do the work properly. The returns made by the local authorities show that in 39 burghs and in 136 slaughterhouses distributed over 24 counties, no meat had ever been condemned. These burghs are all small places, many of them mere villages. There are wide variations in the standard of inspection.

*Report on an Enquiry into a Uniform System and Standard of Meat Inspection in Scotland by Lieut.-Colonel Gerald Leighton, O.B.E., M.D., F.R.S.E., Medical Officer (Foods) Scottish Board of Health.

A high standard is maintained where whole-time qualified inspectors are employed.

Verbatim reports are given of the conclusions reached by three committees of experts appointed by the Board at the request of Dr. Leighton to assist him in the later stages of the enquiry. These committees considered : (1) Questions of administration ; (2) inspection in rural districts ; and (3) the standards of meat inspection, respectively. The following veterinary representatives were included in the personnel :—Professors Gaiger and Matheson, Messrs. Trotter, Gofton, D. Hamilton, Wm. Brown and Medlock, together with Medical Officers of Health, Sanitary Inspectors and representatives from the Board of Agriculture for Scotland, Scottish Chamber of Agriculture, Convention of Royal Burghs, Scottish Federation of Meat Traders, Association of County Councils, and the Incorporated Sanitary Association of Scotland.

The report of the Committee on Administration may be summarised as follows :—

In respect of officials with power to condemn meat, Section 43 of the Public Health (Scotland) Act, 1897, confers co-equal powers on the Medical Officer of Health, Sanitary Inspector and Veterinary Surgeon approved for the purpose of the Section, but the training and duties of sanitary inspectors are for the most part such that they have rarely the opportunity of becoming qualified to perform efficiently the important work of meat inspection. The Committee, therefore, is of opinion that the work of meat inspection should not be entrusted to a sanitary inspector except with the sanction of the Scottish Board of Health, which should only be given (1) when the sanitary inspector concerned possesses special qualifications and (2) when the services of a qualified veterinary surgeon or a medical officer specially trained in meat inspection are not available. They consider that the most appropriate official to be designated for this work of inspection is the veterinary surgeon, but as the work is carried out for the protection of the health of the public, and as the medical officer of health is the responsible official in this connection, the veterinary surgeon should work in close co-operation with him. They therefore recommend " that the actual seizure of meat with a view to condemnation as unfit for the food of man should be in the hands of fully qualified inspectors only, viz., the medical officer of health, or a veterinary surgeon, or a sanitary inspector appointed for the purpose."

In the case of public abattoirs, all detained meat should be examined by a veterinary surgeon or other qualified person appointed and paid by the local authority for that purpose.

In order to secure uniformity of inspection and of general administration, private slaughterhouses should, as far as possible, be abolished. It might not be practicable to accomplish this entirely in remote landward districts, but in the exceptional cases where private slaughterhouses are permitted the hours of work therein should be strictly limited by the terms of the licence, and arrangements should be made by the local authority for the inspection of all meat by qualified inspectors. All persons employed in the actual killing of animals should be licensed annually by the local authority on conditions laid down by the Scottish Board of Health.

The Committee sees no objection to a system of marking meat which has been inspected, but they do not consider this course absolutely necessary except in a few special cases. It is, however, recommended that no carcase should be sent from the area of one local authority to that of another without being marked to indicate that it had been inspected.

All cases in which animals are slaughtered for emergency reasons or dressed for the food of man in premises other than licensed slaughterhouses should be immediately notified to the local authority of the area within which the slaughtering takes place, and the carcase—with the lungs, heart, liver and spleen attached—should be detained until inspected by a qualified inspector. All persons receiving carcases slaughtered elsewhere than in a licensed slaughterhouse in Scotland should immediately notify the local authority of the area in which the carcase is received.

In the Counties of Aberdeen, Ayr, Dumfries, Kirkcudbright and Wigtown at least 30,000 pigs are slaughtered annually on farms and are despatched to bacon curers, etc., without inspection. The provision of adequate inspection for these pigs presents a difficult problem for meat inspectors. To meet this difficulty the Committee makes the following recommendations :—" That pigs should not be slaughtered on private premises except in a part of the premises licensed for the purpose by the local authority ; that such licensed premises and their management should conform to bye-laws framed by the local authority and confirmed by the Scottish Board of Health ; that notification of intention to slaughter should be sent by the farmer or person intending to slaughter to the local authority five days before the date of slaughter, and that the local authority should send an approved inspector to examine the carcase—to which the lungs, heart, liver and spleen must be left attached—before the carcase is passed for human consumption."

(Exception is taken to the recommendations as to the slaughtering

of pigs on farms by one member of the Committee on the grounds that they appear to be contrary to a previous recommendation that all private slaughterhouses should be abolished ; they give an appearance of permanency to an arrangement which ought to be regarded merely as a temporary expedient until central slaughterhouses can be established ; inspection would be cumbersome, expensive and inadequate.)

It is recommended that the Scottish Board of Health should appoint a staff of veterinary inspectors, whose duty it would be to visit systematically the abattoirs in a definite area and report to the Board's Chief Inspector of Foods.

The Committee on Rural Districts and the Committee on Standards each made recommendations, which should be read by everyone interested in the details of meat inspection.

Recommendations were made as to the action to be taken when evidence of tuberculosis is found in bovines and swine, and these should be carefully perused by every student of pathology, whether a graduate or still attending college. For these alone the " Enquiry " is worth purchase.

(In these recommendations a very considerable departure has been made from the recommendations of the Royal Commission on Tuberculosis, which have in many cases continued to be regarded as the guiding principles in the judgment of tuberculosis carcases. The principle has been followed by regarding tuberculosis as in the main a localised disease).

In respect of pigs, the Committee recommends that the same standard of judgment be applied as to bovine carcases, and evidently is of opinion that the recommendations of the Royal Commission on Tuberculosis, to the effect that, owing to the greater tendency of generalisation in pigs, the whole carcase should be seized when evidence of tuberculosis exists, is unnecessarily severe.

A list is given of diseased conditions which should lead to total condemnation, together with instructions for dealing with localised disease.

The report represents a very valuable piece of constructive work, and Dr. Leighton—together with the members of the Committees associated with him in his enquiry—are to be congratulated on the results of their labours.

A decision has been reached by the Scottish Board of Health to issue regulations incorporating the recommendations of the Committees, and for this reason, as well as for the fact that the Report of the

Committees contains much information of value to all who are concerned with meat inspection, we would recommend that it should be carefully studied and should be kept available for reference.

OBSERVATIONS ON THE EGYPTIAN VETERINARY SERVICE.

THE Annual Report (1919-20) of this Department has recently come under our notice, the Director of which (Mr. Littlewood, M.R.C.V.S.) confines his remarks chiefly to statistics. The Report is well worth studying nevertheless, as showing the volume of work passing through the Department, and the obvious indispensability of the Veterinarian to the State. The non-statistical part of the report is concerned with the preventive treatment of rinderpest—or "cattle-plague," as it is called—perhaps from a laudable desire to de-kulturise our nomenclature—and it is evident that this disease is of primary importance in the long list of animal maladies with which the Egyptian Veterinary Service is required to cope.

Few graver responsibilities, indeed, rest upon the Government of any pastoral country than the efficient repression of this devastating disease, and the welfare of the inhabitants of the ancient land of Egypt is closely bound to-day—as it has been from the time of the Shepherd Kings—with the welfare of the ox and the buffalo, not only in respect of food, but also in those essential operations of husbandry —tillage and irrigation—upon which any population ultimately depends.

Rinderpest was a serious consideration to the Government of Egypt in the time of Moses; down to last year the same "very grievous murrain" was responsible for as many as 2,415 deaths—an increase of 888 cases over the previous year's record. This seems at first sight a big animal wastage from a disease which is now considered well within the control of science, but it is evident the Veterinary Department put up a stout fight, for as many as 46,110 animals were immunised by the double or simultaneous method (by which an active or permanent immunity is produced), a result achieved with the small loss of only 171 deaths, or ·37 per cent. of the total. Apparently this number (171) of deaths was not due solely to deaths from rinderpest, for a large percentage of the loss seems to have been incurred from the intercurrent disease (*piroplasmosis*) which is so difficult to guard against when the blood of one animal is introduced into the system of another. Texas fever seems to have been the main difficulty

in this respect, and it is interesting to observe the fact that such cases were found amenable to injections of arrhenal (di-sodic-arseno-benzol).

Interesting details are given of the building-up of a serum herd for the production of immune-serum, such work being under the direction of Mr. Rabagliati, M.R.C.V.S. Provision is now made for the upkeep of 150 bulls in the Serum Institute, which Institute has already begun to issue large numbers of doses of immune serum of high anti-toxic value. Quantities are quoted showing that some 2,700 litres have been elaborated from about 6,700 litres of immune blood, a percentage of about 41·3 per cent. This strikes us as being rather a low yield, and it would be interesting to know the details of the technique employed. Bleeding directly into a decalcifying solution, and separating the supernatant plasma, should yield about 60 per cent. of the original volume. The fact that the plasma would contain a trace of the decalcifying citrate is immaterial in view of the fact that even repeated injections of citrates into the blood-stream fail to alter the calcium balance of the blood, or to act deleteriously in any manner.

Recent work in Australia has shown further that the red-cells abstracted in bleeding can with advantage be returned to the veins, rendering it possible thereby to make very large and repeated bleedings at short intervals without encountering any degree of anæmia—a factor which hitherto has determined the quantity of blood abstracted. Such facts are of importance to serum institutes, and should, if adopted, result in a much extended degree of usefulness.

The serum unit adopted by the Egyptian Rinderpest Institute is 50 c.c. based upon a dose of 1 c.c. of serum to 5 kilo of live weight. This unit, therefore, is one adapted for use in the case of the young animal of about 250 kilo, or say 565 lbs.

The Director speaks of the serious nature of the losses incurred in the fortifying of his serum cattle in the effort to enhance the degree of their immunity. The phenomenon known as *anaphylaxis* ("negative phase")—or that often sudden and fatal collapse which attends the repeated inoculation of blood or other foreign proteid matter—is stated to have been responsible for the death of as many as fourteen of the serum herd.

Such losses—always unfortunate—are serious in proportion to the length of time and trouble taken in bringing the beast in question to a high degree of immunity, and losses from this cause are always regrettable to the scientist concerned. The recent valuable work of Besredka on this subject of *anaphylaxis* should be welcome to the

Egyptian authorities as showing how such serious losses may be avoided and how rapidly (a matter of a few hours only) an *anti-anaphylaxis* immunity can be established in an animal by appropriate modern methods.

While rinderpest bulks large in the Egyptian Report other diseases of great importance are also dealt with. Rabies—as one would expect—exists to a considerable extent, as many as 64 cases having come to light, while the precautionary slaughter of dogs is enormous. In Cairo alone 3,386 dogs and 5,815 cats were destroyed during the year, while in the provinces 43,352 canines and felines were poisoned. Our own "brown dog" pales in colour before such figures.

Glanders seems somewhat on the increase, 106 cases having occurred throughout the year as against 61 last year. Cairo is, as one would expect, the most heavily affected. Only 4,284 mallein tests seem to have been undertaken during the period covered by the Report, which, to those responsible for the clearing up of glanders after the Great War, seems a small number.

The disease *epizootic lymphangitis* is shown to be amenable to injections of nov-arseno-benzol (neo-salvarsan, or "914") and *hæmorrhagic septicæmia*, of which 135 cases were reported, has been treated or guarded against by 4,222 injections of preventive serum. The figures for mange (167) show that this disease is well in hand, in the horse at any rate, and it speaks much for the confidence which our professional brethren are inspiring in that as many as 1,340 camels were treated for mange at the request of, and on payment by, their owners.

We note also that *piroplasmosis* has been treated with success by arrhenal, and that some attempt has been made to strike at the root of this malady by the destruction of the tick, 838 animals having been "sprayed" for this purpose—a not very efficient method unless great care is taken to ensure complete saturation of all parts. It is a matter of some surprise that the use of the dip is not mentioned in this connection, but this great aid to veterinary administration will doubtless —to judge from the evidences of progressive and up-to-date treatment in other directions—soon come into its own.

The figures for tuberculosis are high, though lower than in the preceding year, being 3,108 as against 3,534, but the actual number of cattle and buffaloes has decreased by as many as 43,000, which may account somewhat for the lessened incidence.

Increase of live-stock, however, is shown in other directions, for

the 1919-20 census shows 95,000 goats and 14,000 camels above the census figures for the preceding twelve months.

Sheep from the Sudan seem to be heavily affected with *æsophagostomes*, 720 such cases having been diagnosed (with many other morbid conditions) at the Pathological Laboratory of which Mr. Mason, M.R.C.V.S., is the Director.

Altogether the Report leaves an impression of sterling work being carried out by our *confrères* in Egypt.

We notice some small errors in scientific nomenclature. The unlovely hybrid "serumized" would appear to meet a fitting end by "anaphilaxis"—which latter, by its spelling, suggest an erroneous derivation. "Puerpural" for "purpural" is a curiously inapt term as applied to a morbid condition in a herd of bulls! But such points are trivial and do not detract from the value of the veterinarian's work as reflected in the pages of this Report.

In such a country as Egypt the field of the scientific worker is always "white unto harvest," and we congratulate the Director on the obvious and ample results of his Department's efforts.

The Civil Veterinary Service in Egypt has had probably a unique opportunity of carrying forward the standard of veterinary progress, owing to the fact that for a long period it has been operating over a comparatively small country. We are delighted that we are now beginning to be able to appreciate its progress, which, in our opinion, would have taken place earlier if the necessary driving power had been behind the efforts of its individual members.

ULCERATIVE LYMPHANGITIS IN RETURNED CANADIAN ARMY HORSES.

In the report of Dr. Frederick Torrance, B.A., D.V.Sc., the Veterinary Director-General for Canada, a note is made on the above subject, which again proves the value of competent veterinary inspection and advice; and also proves up to the hilt the wisdom of not having allowed the wholesale re-importation of army horses after the war. Only 105 horses were returned to Canada, and even although these were all officers' chargers, and presumably on that account had been under more care and careful observation than ordinary troop horses, five animals showed definite symptoms of the disease and had to be destroyed. All the others were kept in quarantine until the veterinary experts were satisfied that all danger of incubation and infection had passed.

Clinical.

SARCOPTIC SCABIES (OR ITCH) IN THE CHIMPANZEE.

By A. W. NOEL PILLERS, F.R.C.V.S.,
Liverpool.

It seems, from a survey of the literature, to be generally admitted that scabies in any of the Primates, other than man, is extremely rare; and I have not been able to find, after a lengthy search in our veterinary publications, any reference to the disease in the chimpanzee; neither could I see anything relating to it in *Review of Applied Entomology*. Several authors—Megnin (Les Parasites Articulés); Railliet (Traite de Zoologie Medicale et Agricole); and Schindelka (Hautkrankheiten) refer to scabies in wild carnivora and ruminants, but in no case is any account given of the parasite or disease upon the higher apes. Megnin, however, mentions (p. 438) that P. Gervais once found on a maki (lemur), which had died of mange, some sarcopts which resembled those of man, but upon whose specific identity he was not able to pronounce.

However, Mr. M. R. Johnston, for many years manager for Messrs. Bostock's, and now of the Zoological Department of the Blackpool Tower, informs me that the purchasing of chimpanzees from West Africa demands care, for many of them are affected with a skin disease. He states that attendants may take it upon the arms, but that with care and the use of sulphur ointment the disease upon the chimpanzee can be cured; it then soon disappears from the keepers.

In view of these remarks the following case would seem worth recording, although the animal was dead when examined, and I have therefore nothing to say concerning therapeutic measures.

Some three months prior to death the animal, which was a female about two years old, was imported from West Africa. On its arrival it was stated to be suffering from a skin disease which the attendant seems to have regarded as "sugar eczema." The disease gradually increased in severity, the animal lost flesh, ate very little, and slowly "pined away."

On post-mortem examination, the body was emaciated, with very little adipose tissue in any part of the body. All the internal organs appeared to be normal with the exception of the lungs. These were affected with acute congestion. The small intestine contained 3 *Ascaris sp.*, the cæcum 4 *Trichuris sp.*, and large intestine 50-60 *Ozyuris sp.*

The long duration of the disease had completely masked the typical sarcopt lesion, there being on the affected areas either slight or marked accumulations of scab. Figs. 1 and 2 give a good idea of the extent of the disease, and Fig. 3 shows its advanced state across the top of the shoulders and structures adjacent thereto.

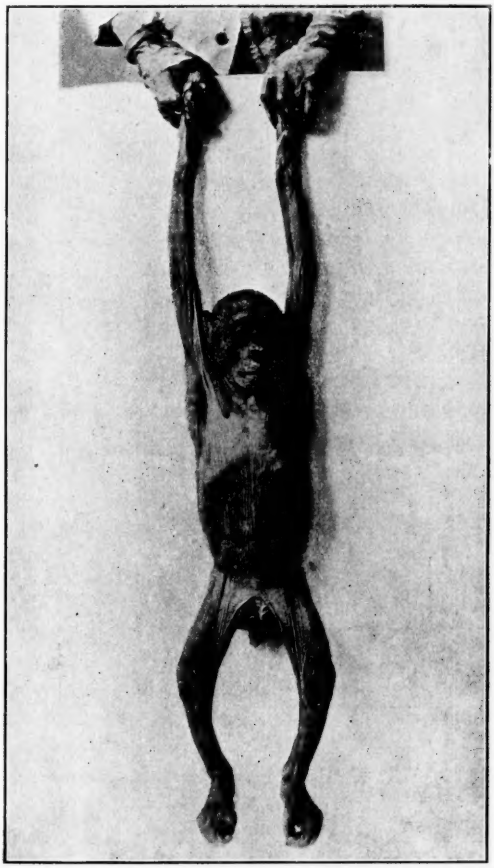
The lesions were widespread, and were either only very slight or completely absent on those positions which are the earliest areas to be affected in man, viz., between the fingers, on the

Photo] [*M. Brown.*

FIG. 1.—Dorsal Aspect.

ulnar border of the hand, on the wrist, on the palm of the hand, on the anterior border of the axilla and at the base of the thorax. The palmar surfaces of the hands were free, as were also the interdigital folds. On the back of the right hand the lesions were diffuse and became aggravated around the origin of the thumb. The left hand

was similarly affected but to a lesser degree. Continuing up the extensor surfaces of the arms the severity became much less at about half-way up the forearm, only to increase again just above the elbow.



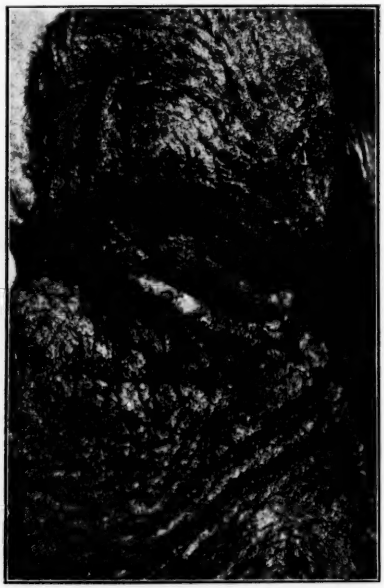
Photo] [*M. Brown.*

FIG. 2.—Ventral Aspect.

At the shoulders, back of the neck, and scapular regions the skin was greatly thickened by marked accumulations of scab, with deep cracks and corrugation. At places there was moisture resulting from the exudation of serum and pus. From the lower aspect of the shoulder-blades, the disease became less marked, but again increased at the

buttocks. From here there were only a few odd or scattered lesions down to the ankles (see Fig. 1). On the scalp the disease started about three inches behind the orbital ridges, and gradually increased in severity as the occipital region was reached. The external ears were markedly affected (see Fig. 3).

Generally speaking, with the exception of an odd spot or two, the flexor surfaces of the arms, the chest, abdomen, inside the thighs and



Photo] [*M. Brown.*

FIG. 3.—View of Scalp, Ears, Neck, and Shoulders.

the external genitalia were free. At the knees there were some definite lesions and these continued a little way down the region outside the fibula. A few areas of disease occurred across the metatarsal regions, but the folds of skin between the toes and soles of the feet were free (see Fig. 2). It will be noted that the whole body shows a marked loss of hair. The sarcopts could easily be seen with the lens, in crusts from the shoulders, and were isolated from several other parts. I am indebted to Miss A. M. Evans, M.Sc., for the following measurements, and to the Liverpool School of Tropical Medicine for permission to publish the photographs.

SARCOPTES SP. FROM CHIMPANZEE.

Stage of Parasite.	Greatest Length in mm.	Greatest Width in mm.	Average. Length in mm.	Average. Width in mm.
Ova 1	·18	·1		
2	·16	·08	·17	·09
Larvæ 1	·17	·15		
2	·20	·17		
3	·18	·16	·183	·16
Nymphæ 1 ...	·20	·19		
2 ...	·24	·21	·22	·20
Pubescent females 1	·31	·30		
2	·33	·30	·316	·296
3	·31	·29		
Males 1	·14	·17		
2	·22	·20	·226	·19
3	·22	·20		
Ovigerous females 1	·50	·37		
2	·37	·31		
3	·37	·31	·41	·332
4	·40	·34		

ENDOCARDITIS IN THE HORSE.

By CHAS. POWELL, M.R.C.V.S.
Woburn.

Subject.—A half-bred colt rising two years old.

History.—I first saw the case on Christmas Eve. The colt had done well and appeared in good health up to about six weeks previous to this. He was then noticed to be standing apart from the others, moved stiffly, showed dulness and began to lose condition. The owner thought the colt had contracted a cold, so fetched him home and housed him. The colt had been at pasture on some local moors and the owner had suspicions that some horses in neighbouring fields had had strangles, but no history of any previous illness of the subject could be obtained.

Symptoms.—Dulness, slight cough, dry and short in character. Marked œdema of sheath, abdomen and hind legs, chiefly in the hock region. Temperature, 102.6 ; pulse, 84, small and weak ; respiration 26 and chiefly abdominal. Mucous membranes slightly pallid and of a dirty tinge.

Auscultation revealed dulness on both sides of the thorax, with rãles on the right. The heart's action was very pronounced and valve sounds distinct, but no murmur could be detected until a day

or two before death, when a distinct murmur took the place of the first sound.

Heart disease was diagnosed and prognosis was hopeless, but at owner's request treatment was tried. The colt lingered on for eight days and was found dead in the box, feeding fairly well practically up to the last.

Post-mortem revealed dropsical effusions in the swollen tissues. The heart was dilated, muscle soft and flabby and of a dirty white colour. The right ventricle contained very large vegetations both on the valve and wall, but especially on the latter. These were very firm and on section showed degenerative centres. The tricuspid and aortic valves were normal.

The lungs were œdematous and of a dirty green colour, but there was no evidence of pneumonia or pleurisy.

The stomach contained plenty of food. Large numbers of bots were present both in this organ and the duodenum, the great majority of which had become detached from the walls.

There were numerous strangles in the colon. No aneurism of the anterior mesenteric artery by these could be detected, although the wall showed evidence of a slight previous arteritis. Both the liver and kidneys showed marked degenerative changes.

PYO-SEPTICAEMIC INFECTIONS IN NEW-BORN ANIMALS.

By L. C. MAGUIRE, M.R.C.V.S.
(*Fairford, Gloucester*).

Having read with great interest the article "Bacillus Coli Infections in the New-Born Foal," by Prof. Gaiger and Mr. T. Dalling in the Veterinary Journal for August, 1921, I feel it is my duty to publish my clinical experience in a form of prophylactic treatment based exactly upon the same theories as those formulated by the above writers. In 1916 I commenced the treatment I am now about to briefly describe, and which I have fully dealt with in my book, "Aids to Serum and Vaccine Therapy in Veterinary Practice," now in the publishers' hands. White scour in new-born calves was very prevalent on several dairy farms in my practice; notwithstanding every hygienic precaution being adopted, the disease continued to persist. It was mostly of the acute form, the calves dying in some cases at, or within, forty-eight hours after birth. The post-mortem symptoms were those of a septicaemia, and in some instances, especially on certain farms, the disease was more chronic. Bacteriological examination of a number of the dead animals revealed mostly organisms of the colon type, in some instances para colon type organisms were

also present. These bacteria were, in most cases, isolated from the joints and other organs. From each farm on which the disease was present I succeeded in obtaining a leg for bacteriological examination. As the organisms were isolated I had a vaccine prepared. Knowing the strict specificity of the colon bacillus, I considered it necessary to have a separate vaccine prepared from the bacteria isolated from each post-mortem specimen taken from the different farms where the disease existed. As the colon bacillus is a common inhabitant of the intestinal tract of animals, and is benign under ordinary conditions, I presumed that the organisms whose virulence had become exalted and was responsible for the disease in the new-born calves were of the same strain on that particular farm, irrespective of the number of animals affected. As new-born animals have no powers of immunity, I sought a means to establish immunity pre-natally, working on the hypothesis that any immune bodies circulating in the humoral contents of the maternal body would be transmitted by way of the blood stream to the fœtus, thus giving the fœtus a post natal-immunity. Although this immunity must of necessity be only of the passive kind yet it is sufficient to protect the newly born animal against the immediate post-natal infection by the organism against which the immunity is established. My method of treatment was as follows :—Having prepared a separate vaccine from the organisms found on each separate farm, I treated the pregnant cows with these vaccines. The vaccination should be carried out in the seventh and eighth month of pregnancy, as abortions may occur if vaccinated later. I gave three injections at intervals of ten days. First injection contained ten millions dead bacilli ; second twenty-five millions, and third fifty millions. The cows did not suffer much inconvenience from these injections—for eight hours or more the animal was a little dull, but this soon passed away. By this method I have completely eradicated white scour from eight dairy farms, the average number of cows on each farm being fourteen, making a total of 112 cows vaccinated. Before this treatment was instituted 40 per cent. of calves born on these farms became affected with white scour. One week after birth each calf received a dose of vaccine, dose being quarter of initial dose employed for the cows. I consider this method of protective treatment in the newly born calf excellent, and am positive it would give similar results in foals. The only disadvantage attached to this treatment is that a separate vaccine must be prepared for each farm, and that at least one animal must have become affected before the specific bacillus can be obtained.

PROLAPSUS UTERI IN THE MARE.

By W. T. HEWETSON, M.R.C.V.S.,
Brampton, Carlisle.

This accident occurs much less frequently in the mare than it does in the cow, and is looked upon by all writers on the subject as being much more serious. This, no doubt, being due to the greater susceptibility of mares to septic infection.

During practice I have only met with six cases in mares that had not previously died from internal or external hæmorrhage due to the accident, and all the six cases treated recovered. This might be due to some extent to good fortune, and not to any special skill or treatment on my part. Nevertheless, it may be of interest if I record one or two cases and the mode of treatment.

Case 1.—I was called eight miles away to a mare that was unable to foal. On arrival I found the mare had foaled, but the uterus was hanging down nearly to the hocks. The walls of the loose box were here and there besmeared with blood, having been rubbed with the inverted portion. I looked upon the case as being very serious, and did not consider there would be much chance of recovery from what I had been taught, and from what I had read.

A supply of warm water was procured, and a dessertspoonful of Jeyes fluid was added to three gallons of the water, the water being not more than new milk warm. It is important that the water is not too hot. It should err on the cold side. Water at 95° F. is suitable for the purpose. The water used should not contain too much Jeyes or sanitary fluid, as this acts as an irritant, causing the patient unnecessary pain, as the genital organs are very delicate and extremely sensitive, and any irritation of these has a very deleterious and depressing effect upon the patient.

After cleansing and washing the inverted portion with the disinfectant water I returned it. This I found much easier done than returning the inverted womb of a cow, which is often difficult. In the mare the vulva is larger and easier dilated, and the pelvis is wider. When I had returned the inverted portion I could not satisfy myself that it was completely returned to its normal position. Fortunately the farmyard was situated on a hill, and the road leading from it to the main road had a good decline. I had the mare led to the top of this road and placed with her fore feet down the hill, and her hind quarters were thus elevated. To restore the inverted portion completely I filled the womb with the prepared asepticised warm water by the aid of 4 ft. of hose piping and a funnel. The mare was then walked down the hill so that the weight of water in the womb would cause it to return to its normal position. The water was expelled from

the womb as the mare returned. The filling of the womb was repeated once more and the mare then led into the loose box and covered with a rug. A laxative ball was then given, viz., 6 drachms of aloes. Six powders, containing ℥ss. each of pot. nit. and pot. chlor., were left, one to be given each day in soft food. The owner was advised to feed the mare sparingly on laxative diet.

Case 2.—Occurred in a mare that was unable to give birth to her foal. I was in attendance about 6 a.m. The foal was born alive, and the mare was left apparently all right, but not cleansed. About 9 a.m. the mare was found lying in the loose box with the womb inverted and the placenta still attached. I did not get back to my patient until 12 o'clock noon. The inverted portion of the womb was by this time anything but clean. As the mare was lying down a sheet was placed under it. The placenta was now removed and the womb washed as clean as possible. This being done, the mare was got to her feet and the womb returned. She was then walked into a field close by, where there was a hill, and led to the top of this. The womb was now filled with disinfectant water, as in the previous case, and the mare walked down the hill. When going down the mare went slowly and reluctantly, but when returning she came back very quickly, the water being expelled on her return. In this case the womb was filled with water three times and the mare taken three times down the hill.

The medicinal treatment was the same as in the previous case. She was visited each day for three days, and the womb was washed out in the ordinary way. The mare recovered without developing any other results.

Case 3.—I received a message to attend a mare with her womb down on a farm fourteen miles away. Ten miles of the distance was travelled by road, and the remainder I walked, being escorted across the fells until we came to a solitary farmhouse. Here I found my patient standing in a loose box, perspiring and trembling all over, with an anxious expression. Some soft food had been placed in the crib, but of this she took no notice. The womb had been put up by the owner. On examination I found it was not completely returned to its normal position. A quantity of warm water was procured and a dessertspoonful of Jeyes fluid was added to a bucketful of water. I had with me 4 ft. of hose piping, but I had not a funnel. Fortunately the owner had an old gramophone horn that answered the purpose admirably. The mare was led on to the top of a hill close by and the womb filled with water, as in the previous cases, and she was walked down the hill with her womb filled three times. It takes about three bucketfuls of water to fill the womb. The mare was then led back into the loose box. By this time the trembling had ceased, and the

mare went direct to the crib and began to eat, showing she had received relief from the means adopted to restore the womb to its normal position.

The same medicinal treatment was prescribed as in the previous cases. I only saw this mare once, yet she made a good recovery.

In all the cases there were not any means used to prevent the uterus from again being inverted. In my opinion there is not any need of a truss or clamp providing the inverted womb, in the first place, is completely returned to its normal position. If this is not, or cannot be, done, then the patient is inclined to press and strain.

The three cases recorded occurred in ordinary Clydesdale mares, so the dose of aloes would need to be regulated according to the size of the patient and the district where situated. It is important to open the bowels, as this tends, in my opinion, to prevent swelling of the injured parts, and I am convinced that in most cases of inversion met with in the cow the bowels are constipated, and this is often the cause of the inversion. A dose of laxative medicine given to cows immediately after the womb is returned prevents straining, and I am convinced the same applies to mares.

TYROTOXICON POISONING IN A LITTER OF PUPS.

By MAJOR H. ALLEN, M.R.C.V.S., R.A.V.C.,
Saharanpur, India.

Tyrotoxicon, a poisonous ptomaine, said to occur in stale cream, cheese and milk products.

History.—A litter of eight pedigreed Irish terrier pups (4 dogs and 4 bitches) were " whelped " by a bitch of mine April 15, 1921.

I transferred the four bitches to a foster mother on April 18, 1921, and also started giving them a milk preparation called " Lactol," mixed in cow's milk, twice daily, concurrently with the milk from the foster mother.

As the foster mother did not seem to be giving a sufficient quantity of milk, I allowed them to be suckled by a goat, four times daily, from May 3, 1921.

The four dog pups were suckled by their mother from date of birth, and started with the goat, besides their mother, on May 3, 1921, three times daily, *but never received any " Lactol."*

Result.—Two bitches died on May 12, 1921. One bitch died on May 14, 1921. One bitch died on May 15, 1921.

Symptoms.—(i) Tongue and gums a dead white; (ii) staggering gait; (iii) emesis and tyrosis (curdling of milk in stomach) during final stages; (iv) semi-comatosed condition; (v) urine and fæces scanty; (vi) dysphœa, convulsions, prostration, complete coma, and death.

Post-mortem.—(*a*) Enlarged liver, weighing two ounces. (*b*) enlarged spleen, weighing one ounce; (*c*) enlarged kidneys, 1¼ drachms each; other organs healthy. One case showed slight congestion of right hemisphere of brain.

Treatment.—Castor oil and stimulants.

Remarks.—I purchased two tins of "Lactol" in January, 1920, and weaned a litter of pups, born December, 1920, with it, with very satisfactory results. I had a balance of half a tin left over.

The "Lactol" used on the litter of May 15, 1921, had consequently been with me for over a year. Its colour was pale yellow, and it gave a decidedly strong cheesy odour.

Enquiry.—Am I correct in attributing death to Tyrotoxine formed by the "Lactol" undergoing putrefaction by decomposition, or by bacterial metabolism? I am confident in my belief in regard to the former owing to the fact that the four male pups are, at the time of writing, all big and healthy. They are being weaned on "Virol" twice daily, in addition to the goat, to which they are put four times daily, as their mother is drying up rapidly owing to the heat.

A STRANGE FOSTER MOTHER.

By NEIL A. McEWAN, M.R.C.V.S.,
Wigtown.

It is curious how the maternal instinct will develop itself, and numerous cases have been authenticated of one species of animal suckling the young of another; in the VETERINARY JOURNAL of October last year there was a photograph of a bitch of the Alsatian breed suckling six small pigs.

An equally extraordinary instance, of which I enclose the photograph, has come under my own personal observation, and relates to a ewe which adopted a young pig. She had lost her lamb, and the young pig went to her voluntarily. From the first she took to it and allowed it to suck, the little pig squatting on its haunches in a sitting down position to do so.

She protected it most jealously against any projected interference on the part of the other ewes, and in the cold spring weather, when the ground was cold, the pig slept on the ewe's back. At the present time

the pair are now on the hillside at pasture with the rest of the flock. It is weaned and weighs about three stone, being in perfect health and slightly heavier than the other members of the same litter.

Abstracts.

CONCERNING A FREE-MARTIN.

By Colonel Sir ROBERT FIRTH, K.B.E., C.B.

A FRIEND of mine who goes in for breeding cattle showed me recently one of those mysterious and somewhat uncommon quadrupeds known as free-martins. The animal in question was an apparently sterile cow born co-twin with a potent bull. My friend, who is a very intelligent layman, amused me much with his comical explanation of the unwonted birth of the animal; into those explanations I need not enter, but, having dabbled a little in genetics, I was able to give him a more scientific explanation of the occurrence, and as the matter has a general bearing on the theory of the differentiation of sex it may be of interest to readers of this journal.

To begin with, I premise that the reader is more or less familiar with the Mendelian phraseology, and, therefore, would say that a free-martin is a pure or extracted recessive in respect of its genital determinants, and that the potent twin is a pure or extracted dominant, both being of F^2, in the Mendelian scheme. If the reader be unskilled in recent embryological theorizing, this statement may seem not very helpful, but it will be more comprehensible if it be borne in mind that there is reason to think that, in humans and the vertebrates generally, the female and the male have each not only characteristic sex organs fully developed, but also traces of those of the opposite sex. The conclusion is drawn that the ova and the spermatoza are gametes, each of two types ; thus there are two male gametes of unequal value and two female gametes also of unequal value. One male gamete contains the male-sex-unit character, and one female gamete has the female, sex-unit character ; consequently we may speak of a male sex gamete and a male non-sex gamete, and of a female sex gamete and a female non-sex gamete. A further hypothesis is that the crossing of a male sex gamete with a female non-sex gamete will give a fertilised ovum or zygote which will develop into a male holophyte or fully developed organism, and that the crossing of a female sex gamete with a non-sex male gamete will give a female holophyte—the sex being determined and unalterable as soon as the zygote is formed.

According to modern teaching, in the male genital unit there are potent and dominant male elements, as represented by the testes, the phallus, prostate and prostatic urethra, scrotum, Wolffian ducts and Wolffian bodies, the gubernaculum and the caudal ligament of the testis ; while the non-potent or recessive elements in the male are the mammæ, the prostatic utricle, fimbriated ends of Fallopian tubes and the paradidymis. The female genital unit is also represented by potent or dominant female elements and non-potent or recessive female elements. Among the former are the mammæ, ovaries, ovarian ligaments, Fallopian tubes, uterus, vagina, hymen and urino-genital sinus. In addition to the foregoing, the round ligament, labia major and minora, and the glans, are potent and dominant female elements, less fully developed than in the male, but always analogous to a definite continuous segment of the corresponding male organs. On the other hand, the epoc̆phoron and upper portion of the Wolffian duct, which are equivalent to corresponding fully developed organs in the male, but less perfect in structure, and not equally functional, are regarded as non-potent or recessive female elements.

The practical interpretation of these genetical hypotheses or views is that a free-martin is not a hermaphrodite, but may be one of two types. If born co-twin with a potent bull, such as was the beast belonging to

my friend, it is really a sterile male, and, according to the Mendelian scheme, would have originated in the following way. A male sex gamete united with a female non-sex gamete and gave a zygote F^1; this, owing to it twinning, gave a bull with equivalent soma and dominant or potent genital organs and a bull with equivalent soma and non-potent genital organs of the female and recessive type. These twins constitute F^2 in Mendelian language, and were the potent bull and the free-martin respectively, the former being a pure or extracted dominant and the latter a pure or extracted recessive and really a sterile male. The other and much rarer type of free-martin is the one born co-twin with a potent cow, and which really is a sterile female. The originating elements in this case being a non-sex male gamete uniting with a female sex gamete. Apart from the question as to how free-martins originate among cattle, the hypothesis of varieties of gametes and the distinction of the genital organs into dominant and recessive or potent and non-potent parts or representatives affords an explanation of the presence in one sex of rudimentary organs of the other as well as of the occurrence of the strange structures known as teratomata or embryomata. The view held generally is that a teratoma arises from a non-sex variety of gamete, that is, that the testicular teratoma is derived from an imperfectly reduced non-sex male gamete, and the ovarian variety from an imperfectly reduced ovum. Obviously, the whole subject is both intricate and difficult, requiring close study and a working knowledge of Mendel's law in all its ramifications; but it would seem that, little by little, some of the most mysterious phenomena of generation and its anomalies are being better understood, and that there is a reasonable hope of disorder being reduced to order and an explanation forthcoming of many matters regarded hitherto as inexplicable. Anyone wishing to pursue this subject further will find a suggestive article on differentiation of sex by Berry Hart in the *Transactions of the Edinburgh Obstetrical Society*, vol. xxxiv, pp. 303 to 357, and for additional anatomical knowledge as to free-martins the same worker gives much information in *Proceedings of the Royal Society, Edinburgh*, vol. xxx, pt. 3, pp. 230-241.—*Journal, R.A.M.C.*

POISONING OF CATTLE BY FEEDING ON OLD MEALIE LANDS.*

By D. T. MITCHELL, M.R.C.V.S.,
Acting Director of Veterinary Research, Veterinary Research Laboratory, Onderstepoort.

DURING recent years, in various parts of Natal, a number of cases of paralysis in cattle have occurred when the animals have been

* This article, taken from the May number of the *Journal of the Department of Agriculture* (Union of South Africa) is of interest, as the symptoms are similar to some which have occurred from time to time in Great Britain from feeding on mould infected grain.—(Ed. *V.J.*)

allowed access to mealie lands for grazing purposes in the latter part of the winter.

It is customary in Natal, when harvesting mealies, to discard all badly formed cobs, which are either left on the stalk or dropped on the ground. In this way, when cattle are changed to old lands, there are lying around considerable numbers of old and damaged cobs which have been exposed to the weather for some months, and these are readily eaten by the cattle. Owing to this, and to the fact that the cobs are found in many of the districts in a very mouldy condition, it has been suspected by farmers, in areas where the paralysis among cattle occurs, that this condition is due to cattle eating a large quantity of these diseased mealies. Positive experimental evidence on the subject was, however, lacking. Feeding tests carried out at the Veterinary Research Laboratory, Pretoria, with material (mealies on cob) obtained in the Ixopo Division, Natal, failed to give any positive results. The animals used in these experiments were two sheep, two goats, one calf, and one mule. The experiments were continued for three weeks, during which time the calf, sheep, and goats received an average total of 33 lbs. of cobs per week, and the mule 15.5 lbs. per week.

During the last five weeks of the tests soaked mealies was given. One heifer was fed on a culture of the fungus grown on crushed maize from one to one-and-a-half months; this animal consumed 23 lbs. of this material between March 19 and 31. No symptons other than a slight loss of weight could be observed in any of the animals under observation.

From the subsequent experiments on Diplodia-infected maize it would appear that the quantities fed at Pretoria were too small to produce effects, or, what is more probable, that the supply of cobs forwarded for experiment contained only a small percentage of infected grains.

Reference to these experiments will be found in a pamphlet* published by Dr. Van der Byl, of the Division of Plant Pathology. This pamphlet gives a detailed description of *Diplodia zea*, with photographs of infected maize cobs, and should be consulted by those interested in the feeding tests referred to herein.

From these previous experiments it was concluded that the maize so infected had no harmful effect on animals to which it was fed.

Although these results were fairly conclusive, the experience of many farmers pointed definitely to the harmful results of allowing

*" Preliminary Investigation of the Deterioration of Maize infected with *Diplodia Zea* (Schw.), Lev," from the Transactions of the Royal Society of South Africa, Vol. IV., Part 3, 1915.

cattle to graze in mealie lands where cobs were abundant and which, for the first few days at any rate, constituted almost the sole article of diet.

For this reason it was decided to commence a series of experiments at the Maritzburg Laboratory, utilising mealie cobs obtained from farms where the disease had recently occurred.

Through the assistance of Mr. Power, Senior Veterinary Surgeon, Natal, sufficient material was obtained for the tests from various farmers in the Estcourt Division. Some cobs were forwarded to the Government Botanist, Pretoria, for determination of the infecting fungus present, and were reported on by him as follows: "The mealie cobs referred to in your minute of September 30 last are infected with the fungus *Diplodia zea.*"

For the tests four oxen were selected which had been on the station for about two years and had been fed only on grass in the paddocks adjoining the laboratory. These animals were about five years old and in good condition. During the experiments they were tied up in the stable and watered by hand with water obtained from the river close by. The mealies on the cob were fed as received from the farmers, but in all cases the mealie grains only were eaten, the central core being rejected. It is, therefore, difficult to say definitely what weight of material was actually eaten.

Quantities of material fed:—

Ox No. 88	360 lbs.
Ox No. 90	270 lbs.
Ox No. 94	225 lbs.
Ox No. 87	*ad. lib.* about 145 lbs.

Of these four animals one ox did not show any departure from the normal, and the remaining three developed typical symptoms.

General Notes on the Experiment.

With the exception of Ox. No. 87, the feeding on the mealie cobs was discontinued as soon as the first symptoms were shown. In the case of Ox No. 87 the feeding was continued up to the time of death. It is considered that had the feeding of cobs been discontinued when symptoms of improvement were shown death would not have ensued. In the other animals under experiment no medicinal treatment of any sort was administered, and the recovery in their case is attributed to the fact that as soon as the first symptoms of paralysis or inco-ordination of movement were first observed the animals were not given any more mealie cobs. The additional ration of sugar-cane which was administered in their case could not be supposed to have any special curative influence other than that exercised in general by the good nursing which was accorded to the cattle. The amount

of cobs fed to the experimental animals was considerable. In the case of Ox No. 87, it was observed that although this animal consumed the smallest quantity it was followed by fatal results, and that although a similar quantity of mealie cobs of the same lot was fed to animal No. 94 this animal recovered. The effect produced would doubtless depend on the degree of infection of any particular lot of cobs with fungus, but in view of the above-mentioned fact it would appear that the particular idiosyncrasy of the animal was also a determining factor.

The general health of the animals in experiment did not seem to be greatly affected. The appetite was well maintained, and with the exception of a slight degree of diarrhoea in the earlier stages no derangement of the stomach or intestines could be noted. In the latter stages constipation was present.

Practically no elevation of temperature was noted, and it was on this account, associated with the fact that the appetite was maintained well throughout, that there was such a slight loss of condition in the animals during experiments.

The foregoing experiments demonstrated conclusively that the feeding of oxen with mealie cobs infected with *Diplodia zea* produced a condition in the laboratory experimental animals which was indistinguishable from that occurring in cattle which gained access to mealie lands, and it was therefore concluded that the conditions were one and the same. As it was still not possible to say what was the actual exciting cause of the intoxication—whether it was due to the fungus, to the products of its metabolism, or to alterations in the starchy content of the grain on which the fungus was growing—a series of experiments were therefore undertaken to elucidate this point.

Through the kindess of Dr. Van der Byl a pure culture of *Diplodia zea* was obtained and a number of preliminary experiments undertaken in order to ascertain under what conditions the fungus could be grown in bulk on maize, etc.

After some preliminary work it was found that the *Diplodia* would grow well at 27° C. in Mason's jars filled with sterile crushed maize. The lids of these jars had a half-inch opening drilled through to allow for inoculation of the medium with fungus spores. Growth was allowed to proceed for two months.

Notes on the Experiments.

Of the three animals which partook of the culture of *Diplodia* on sterile maize in quantities of 20 lbs. each two developed symptoms.

These symptoms resembled those produced by feeding on infected cobs, but the onset after the commencement of feeding was shorter, and the symptoms were much more acute. The period during which

clinical symptoms remained was shorter and recovery more rapid. These differences can be accounted for by the fact that the animals received a large dose of more highly concentrated material than was the case in the cob-fed animals.

The absence of symptoms in one ox may have been due to a tolerance resulting from an attack in the preceding year.

Conclusions.

From these experiments it was concluded that a condition indistinguishable clinically from that produced by feeding on infected cobs or occurring naturally in infected mealie lands could be set up by feeding on a culture of *Diplodia zea* grown on sterile maize.

Further experiments were carried out to determine whether allied species of fungi (mucor) grown under identical conditions would produce similar symptoms and whether *Diplodia zea* grown on a cellulose medium would give rise to the condition when the medium was fed.

All these experiments gave negative results.

General Conclusions.

(1) That a disease in cattle characterised by inco-ordination of movement and paralysis is set up by feeding on mealie cobs which are infected with *Diplodia zea*.

(2) The cultures of *Diplodia zea* grown on sterile maize when fed produce clinical symptoms indistinguishable from those set up by feeding on infected cobs.

(3) That the intensity of the symptoms and the mortality depend upon the quantity fed and on the percentage of infection present in the grains.

(4) That cultures of allied species of fungi grown on maize are incapable of setting up similar clinical symptons.

(5) That the casual factor is not the fungus itself, but must be looked for in the material which is formed as a result of the interaction of *Diplodia zea* during its development in the starchy content of the maize grains.

General Description.

The following is a brief description of the disease as it occurs under veld conditions :—

Geographical Distribution.—In Natal the reports of the presence of the disease would appear to be limited to the high veld parts of the country, and in these areas the occurrence of a disease in cattle resembling this condition has been very common during the last two seasons. In most cases it has been impossible to entirely eliminate all other factors, such as poisoning by poisonous plants, etc., owing to lack of opportunity to investigate each outbreak reported, but it

may be taken that cases of the disease have occurred in most of the high veld mealie-producing centres of Natal. The losses were most severe during the season preceding these experiments in the Estcourt Division, and it was from this district solely that the material was obtained for experimental purposes. Reports of a few outbreaks have also come to hand from the Ixopo Division, but material obtained from this district failed to reproduce the disease in animals at the Research Laboratory, Onderstepoort.

Seasonal Occurrence.—The disease is limited to the late winter months, July to September. This is the period when veld grazing is very scanty, and it is the custom for farmers to turn their cattle at this time into the mealie lands for better food.

Animals Affected.—The disease is limited to cattle, animals of all ages and sexes being equally susceptible. Some reports have mentioned the fact that sheep were also susceptible, but up to the present it has not been possible to confirm this. Horses, mules and donkeys would not appear to be susceptible, as these animals graze over the same area where cattle are dying of the disease without suffering any harmful results. No cases have been recorded of goats or pigs having been affected.

Cause.—The disease is only found associated with mealie lands, and it is popularly supposed by the farmers of the affected areas that it is caused by feeding on mealie cobs which have lain for some months on the ground. In the experimental investigations mealies which had been subjected to these conditions were found to be capable of producing a similar train of symptoms, and this supports the opinion of the farmers. Examination of the cobs fed revealed the fact that a very great percentage were infected with the fungus *Diplodia zea*. Experiment evidence has shown that cultures of *Diplodia zea* in sterile maize when fed to animals can set up clinical symptoms which are similar to those shown in animals contracting the disease naturally, and further experiments indicate that the results are produced by a substance of, at present, unknown composition formed during the growth of the fungus in the maize grains.

TIME AFTER EXPOSURE AT WHICH THE FIRST SYMPTONS ARE SHOWN.

In natural conditions in the veld, cases have been known to occur in six or eight days after the animals were placed in the lands. In the laboratory experiments the shortest time which elapsed between the commencement of feeding on the cobs until the first symptoms were shown was three days and the longest fifteen days. The animal which developed symptoms in three days was a very ravenous feeder, and this may account for the short time which elapsed before symptoms were shown. It may be taken that the development of the symptoms

depends on the quantity eaten and the condition of the cobs with reference to their degree of infection by the fungus.

Symptoms.—The first symptoms noted are lachrymation and salivation accompanied by slight quivering of the muscles of the flank and shoulder. The back is slightly arched, and the animal stands with its legs farther apart than normal. The head is carried low and the ears droop slightly ; the faeces are mostly soft, but no diarrhoea is present. In this stage, if the animal is walked, only slight symptoms of inco-ordination of movement are to be noticed. Later, these symptoms are aggravated—profuse salivation and lachrymation are apparent—muscular tremors become general. The coat stares, back is very much arched, and the animal has a dejected appearance. Progression is slow and the animal only walks when compelled to do so. Symptoms of inco-ordination of movements are evinced by high stepping of the legs. Lateral swaying of the body and sometimes a tendency to progress with the hindquarters bent to one side. The animal falls after walking a short distance, unless supported. These symptoms last for about one or two days, after which the animal is unable to rise without assistance, and when lifted stands with the legs wide apart and the head down, and showing irregular spasmodic contractions of the leg muscles. The tail is flaccid ; on walking the animal knuckles over at the fetlocks of both fore and hindlimbs, frequently plunging head foremost on the ground after a short distance. Sensation is retained in the muscles. Rumination is suspended, but the animal feeds occasionally and drinks fairly well. If cobs are still administered to the animal the symptoms become more pronounced, and soon the animal is unable to stand on being lifted. It remains lying on the ground, feeding occasionally. Constipation now ensues, the faeces which are passed being coated with mucous, which is blood-tinged. Death is preceded by a complete loss of tone of the muscles, the animal lying stretched out and comparatively limp.

If feeding on the mealie cobs is discontinued when well-marked clinical symptoms develop, recovery is fairly rapid. The appetite returns and the animal feeds on green stuffs freely. The symptoms of paralysis disappear in a few days, but stiffness in movements persists for some time. In one case which recovered, knuckling over at the fetlocks continued for over a week when other symptoms had disappeared and the animal developed a bony callus on the anterior aspect of the fetlock joints of the fore legs.

The temperature shows practically no alteration throughout the illness. The pulse is early affected, becoming rapid and thready, and in the case which terminated fatally almost imperceptible for the last two days of life.

Lesions on Post-Mortem.—In one case which was available for examination the chief lesions present were a well-marked catarrhal enteritis, affecting the small and large intestines. Acute diffuse hyperaemia of both kidneys and well-marked congestion of both lungs.

Mortality.—The mortality varies considerably on the various farms. In some, practically all the animals which develop symptoms succumb, while in others a large percentage recover. It would appear that the mortality is greater in the latter part of the season.

Treatment.—No treatment was adopted in the case of the animals which recovered and in which the disease had been artificially produced, other than good nursing. It is necessary to remove the animals at once from the lands as soon as the initial symptoms appear. Affected animals should be given a saline purge, so as to empty the intestines of ingested irritant material. The animal should, if possible, be housed and given some green food, or if none is available an addition of a daily dose of linseed oil to the ordinary food is indicated.

Prevention.—Collection of all damaged cobs at the harvesting should be practised. As the suspected causal fungus is most prevalent in old mealie lands these lands should be allowed to lie fallow for a season or, if this is impossible owing to lack of other suitable agricultural lands on the farm, strong measures should be adopted to get rid of the fungus itself on the lands. In view of the fact that the fungus had been demonstrated in the stalks as well as in the cobs, it would be advisable to burn off all the vegetation in the lands as soon after the mealies are harvested as was possible. By this means, complete sterilisation of the whole area would be ensured, and in the following season the cattle might be allowed access to the mealie lands with safety.

It is strongly recommended, however, whatever general treatment of the lands is carried out, that on succeeding years *all* cobs should be harvested.

THE MISUSE OF FISH MEAL: A WARNING TO FARMERS.

MANY agriculturists have of recent years begun to use fish meal as a valuable adjunct to the normal diet of many animals and birds; in the proper proportion, which is a small one, it forms one of the cheapest sources of protein in the ration. About 5 per cent. in the case of chickens, 10 per cent. for pigs, 10 per cent. for ducks, 2 ozs. per 100 lbs. live weight for sheep, 1 part in 7 to calves, 3 lbs. per day to milch cows, 2 lbs. per day to fattening beasts, and 2 lbs. a day to horses are about the proper ration, calculated on the safe side, and provided always that the fish meal is produced from white fish only

and has a salt content guaranteed not to exceed 4 per cent. Those who select their fish meal carefully and limit it to 10 per cent. of the total dry food consumed are working on perfectly sound lines and are feeding with a product that has an average albuminoid value of about 55 per cent. On the Continent the advantages of feeding with fish meal have been realised so fully that before the war, out of a total of 40,000 tons manufactured in this country, 30,000 went to Germany. Unfortunately, fish meals are made from oily kinds of fish that impart a strong fishy flavour to the fat of animals feeding upon the meal. Even the best fish meal cannot be trusted not to affect the meat of animals consuming it if it is fed in proportions greater than those given above. Again, certain compound meals contain fish meal, and their users have not, in consequence, known how much fish meal they were feeding to their stock. From one or other of these causes the result has been that when the pig has gone to the butcher or the bacon factory it has been found that the flesh has not only a fishy odour, but a fishy taste, and that the carcase is unsaleable. The feeders have either been using a wrong brand of fish meal, that is to say one made from herrings and other unsuitable material, or they have used the right sort of fish meal in excess, or they have used a proprietary pig meal containing a full proportion of fish meal and have added extraneous fish meal to the ration in ignorance. It must be remembered that once a pig acquires the fishy taint it takes a long time to remove, and if fish meal be misused it goes without saying that butchers and curers will demand a certificate to the effect that the pigs they buy have not been fed with it in any form. Should this happen, a valuable food will be lost to the country, and the loss is quite unnecessary, for it is not the use, but the misuse, of fish meal that must be guarded against. The Ministry's Leaflet (No. 333), of which anybody can obtain a copy free of charge, sets out the position quite clearly, and must serve as a useful guide to those who are in any doubt as to the proper ration. At the same time buyers of compound feeding stuffs containing fish meal, the presence of which is always perceptible, should insist on knowing the percentage and nature of the fish meal that is present in the mixture.—MINISTRY OF AGRICULTURE AND FISHERIES.

Translations.

TREATMENT OF ULCERS OF THE CORNEA.

THE classic treatment in France of Keratitis with desquamation of the corneal epithelium, and especially of infectious Keratitis,

consists in the use of an ointment of finely ground yellow precipitate such as :—

Yellow oxide of mercury	1 gramme
Lanoline	4 grammes
Vaseline	16 „

or of a collyrium like :—

Nitrate of silver	20 centigrammes
Stovaine or syncaine	40 „
Distilled water	40 grammes.

Numerous oculists have recently vaunted the good effects obtained in man by the use of tincture of iodine in the treatment of corneal ulcers. The medication is not irritant if made in the following way :—

The tincture of iodine ought to be fresh (not more than 15 days old), the hydriodic acid being irritant to the cornea. The cornea is anæsthetised by a few drops of a 2 to 4 per cent. cocaine solution and the application is made with the help of a stylet or a wood match stick, on the thin extremity of which one wraps a little well-pressed cotton wool, which is dipped into the tincture of iodine ; care is taken in withdrawing it from the bottle to draw the wool over the neck, so that it does not contain an excess of the tincture. This done, the operator touches the ulcer lightly, which becomes coloured by the instillation, so that its extent is well defined.

M. Van Liut, of Brussels, has obtained some remarkable results in man by the simultaneous use of tincture of iodine and yellow precipitate ointment (Archives of Ophthalmology, June, 1920). At first sight the combined use of these two agents seems to constitute a therapeutic heresy, for one is advised to avoid simultaneous applications of salts of mercury and iodine for fear of formation of iodide of mercury, a very irritant revulsive, and which one abstains even from prescribing in mercurial collyria on subjects submitted to iodide treatment. But it is sufficient in order to render the combination impossible to have a sufficient space of time between the applications of the iodine and the mercury compounds.

This is the technique to follow :—

1st and 2nd day.—Yellow ointment morning and evening.

3rd day.—Tincture of iodine morning ; yellow ointment at night.

4th day.—Yellow ointment morning and night.

5th day.—Tincture iodine morning ; yellow ointment night and carry on in above sequence until cure is complete.

This combined method brings about rapid cicatrisation of the corneal ulcers and even cures those which will not heal when either of the two mentioned agents are used alone.—*Revue Vétérinaire.*

G. M.

A PRACTICAL PROCEEDING TO OBTAIN COMPLETE ANÆSTHESIA OF THE UPPER MOLAR TEETH IN THE HORSE.

By VAN DEN EECKHOUT.

After some general considerations on the advantages of local anæsthesia, which tends to replace general anæsthesia, except in major operations in the abdominal region, the author specially studies the application of this method to extractions of the teeth.

Anæsthesia is obtained by practising the injection of a solution of cocaine adrenalin into the superior dental conduit so as to act on the superior maxillary nerve at the level of its exit from the maxillary branches. According to the anatomical disposition the anæsthetic injected has the effect of anæsthetising the molars, canines, incisors, the sinuses, the upper lip and the nose on the side corresponding to the injection. The solution injected is as follows :—

Hydrochlorate of cocaine	5 grains.
Hydrochlorate of adrenalin (1 in 1000) ..	5 drops.
Distilled water	160 minims.

The injection is practised by means of a syringe provided with an appropriate needle, presenting the conformation of a small trocar with a stylet terminating in a blunt point. It is made into the infra orbital foramen.

This is situated under the sus-maxillo-labial muscle, a little below a horizontal line passing beneath the inferior extremity of the molar apophysis, the head being held in a vertical position. The operation is done on the cast or standing animal. With the finger one locates the infra-orbital foramen by slightly pushing aside the sus-maxillo-labial muscle towards the median line ; the skin is incised with a bistoury, and the needle, armed with its stylet, is introduced into the dental foramen, and made to penetrate as far as possible. The stylet is withdrawn, the syringe is fitted to the needle and an injection of 85 minims of the solution above-named is given ; the needle is withdrawn, care being taken to compress the region for one or two minutes.

Anæsthesia is complete at the end of 10 to 15 minutes. The operation is not followed by any harmful results if the solution injected is perfectly sterile.—*Rev. Générale de Med. Veterinaire.*

G. M.

[In the *American Journal of Veterinary Medicine* for January, 1918, Major Merillat writes :—" To control the pain of extractions . . . . we use a 2 per cent. solution of cocaine hydrochloride, injected with a long hypodermic needle into the region of the maxillary hiatus for maxillary molars, and into the region of the mandibular foramen for

mandibular molars." This latter is the most useful for the practitioner, because in perhaps nine cases out of ten it is a lower jaw molar that needs extraction. The subject was referred to in an editorial on pp. 6 and 7 of THE VETERINARY JOURNAL for January, 1920.—SUB-EDITOR.]

THE INTERNAL SECRETION OF THE TESTICLE AND ITS STRUCTURAL AND PSYCHICAL INFLUENCE ON MEN AND ANIMALS.*

FROM much anatomical, histological, clinical and chemical research work, and from experiments made during recent years on the subject of the internal secretion of the testicle, a good deal of light has been thrown on the vast and obscure field of sexual life. One can assert to-day that sexual life, normal as well as perverted (homosexuality), is dependent on the anatomical structure of the testicle. The histological structure controls the various psychological stages in man and animals and decides whether heterosexual or homosexual tendencies will assert themselves. In 1889, Brown-Sequard drew the attention of scientists to the subject of the internal testicular secretion. As the result of injecting himself at the age of 72 years with testicular extract from the dog, Brown-Sequard stated that his physical and intellectual powers were rapidly improved. His sensational publications have been the origin of much work on this subject and have founded the base of "organo-therapy" *i.e.*, if organic troubles can be laid to the account of insufficient secretion of certain glands such as the testicles, ovaries, thymus, suprarenal capsules, pancreas, thyroid bodies, and spleen, organo-therapy has succeeded in disguising temporarily the nervous symptoms which follow the removal or pathological alteration of certain glands, but no preparation has been able to permanently remove the structural psychical symptoms supervening on the non-functioning of these organs. If organo-therapy has not given all the satisfaction claimed for it, the many and varied experiments carried out have not been in vain, for laboratory experience has demonstrated in an unrefutable manner the existence of an internal secretion. This secretion has provided for us the explanation of certain pathological and psychological lesions. The researches of Bouin and d'Ancel, of Tandler and of Gross have shown that the glandular tissue proper of the testicle has nothing whatever to do with this internal secretion, but that the intermediary substance—the "interstitial gland" of Bouin and d'Ancel and the "gland of puberty" of Steinach—between the testicular canals assumes all the responsibility of that secretion. Bouin and d'Ancel ligatured the *vas deferens* and this brought about

*Translated from the *Recueil de Med. Vet.* by Capt. E. Victor Hobbs, M.R.C.V.S.

the atrophy of the spermato-generative portions of the testicle, whilst leaving intact the interstitial testicular cells. The authors stated that in spite of putting out of action the glandular substance, the secondary sexual characteristics remained active, a fact which proved that the interstitial gland—that is to say, the intermediary cells—is the seat of the internal secretion.

Tandler and Gross obtained the same result by the application of the Rontgen rays to the epithelial cells of the vesiculæ seminales. The "X" Rays brought about "impotentia generandi," by the alteration of the structure of the epithelial cells, but the secondary sexual characteristics disappeared only if the intact intermediary cells are destroyed by castration. Zoth and Pregel state the sub-cutaneous injection of testicular extract revives the "will to work," removes the sensation of fatigue and provokes the feeling of good health. For a long period the power of excitation has been attributed to spermatic crystals, obtained by tritination and desiccation of the spermatic fluid, but a definite proof has not been reported. One has known since time immemorial that castration of man and beast brings about profound organic changes. With the individual castrated before puberty the primary sexual characteristics are never developed. The prostate gland and the vesiculæ seminales atrophy in the castrated man and animal. The corpus cavernosum of the penis and the ischio cavernosus muscle are not developed and the individual resembles a child or a woman. Castration exerts an influence not only on the sexual aspect, but the whole organic system is affected. The beard of the man does not grow, his voice remains juvenile, and he retains a small and infantile larynx. The castrated man has an adipose tendency, his hair grows rapidly and remains "fluffy." Such profound organic changes can only be ascribed to the internal secretion. Foges removed the testicles of young cockerels and then transplanted a piece of testicular tissue in their abdominal cavities. The secondary characteristics such as the comb, showed themselves, proving that the testicles, although not occupying their normal position, can produce these secondary sexual signs. The veterinary surgeon is not concerned with the psychological changes in the gelding, but we know that in the human subject grave troubles follow the operation. The castrated man becomes depressed, haunted with suicidal ideas, without energy and regardless of feminine charms. Hospitals during the war presented a vast field of observation on this subject. Robert Lichtenstern, of Vienna, has sought to dissipate this psychical depression by the transplantation of normal testicles in castrated men. He took as his guide the experimental transplantations carried out by Steinnach, with animals who had shown that the spermatic fluid was secreted by the

intermediary substance and not by the testicular canals. Thanks to these transplantations Steinnach succeeded in reviving the sexual ardour in castrated animals, old and young, and by transplanting both testicle and ovary into castrated animals he even produced artificial hermaphrodites manifesting the bodily and mental signs of both sexes. The experiences of Steinnach have been controlled and confirmed by Athias, Brandes, Lipschütz, Goodale and Knüd-Sand.

Lichtenstern, carrying on from the experimental transplantations of Steinnach; had the idea of performing the same operation on castrated men. The operative technique is as follows :—The excision is made in the inguinal region as for hernia, the muscle after being released from the fibrous tunic is lightly scarified for about four centimetres. A portion of testicle cut into two halves is sutured on to the muscle with catgut. A first suture fixed to the fatty tissue exercises a certain pressure upon the testicle with a view to rendering adherence more intimate and permanent. The operation is completed by one suture in the skin. In 14 cases L. obtained a permanent fixture. The material transplanted consisted in three cases of normal testicles, and in 11 cases of well-developed inguinal testicles provided by individuals normal in a sexual sense and whose psychological integrity had been definitely established. The transplantation must take place direct from person to person and the testicle kept at normal temperature. Among the persons operated on L. found a homosexual individual whose testicles had been tuberculous and removed in 1916. This man, aged 30, presented several feminine characteristics. His abnormal sexual ardour had diminished after castration, but had not completely disappeared. L. stated that a portion of testicle the size of a hazel nut, which was found remaining in the scrotum, was the cause of the continued partial homosexuality. The operative success has been surprising. The homosexual tendency has been changed into a heterosexual one, the feminine sexual characteristics have rapidly diminished and four years after the operation the results obtained still remain. On examining the testicles of homosexuals operated on by L., Steinnach stated that their interstitial tissue showed large cells with two centres or kernels, the cells being isolated or confluent, and to which he attributed the feminine properties which are apt to act antagonistically to the male cells. Normal testicles, even in cryptorchids, do not include such cells.

L. is of the opinion that any homosexuality of man and beast must be laid at the door of a hermaphroditic tendency shown by the " gland of puberty," and that the intensity of both physical and psychological phenomena among homosexuals depends on the number of these feministic cells. The experiences of Steinnach and Lichtenstern

demonstrate the invigorating power of testicular matter on both body and mind, and the author is of opinion that further researches are indicated in order to ascertain the amount of power conferred on horses by such transplantations ; such power as can be demonstrated in working energy and in stimulation during periods of convalescence.—(*Recueil Med. Vet.*) E. V. H.

Personal.

Congratulations to Colonel W. A. Wood, M.R.C.V.S., the Lecturer on Elementary Veterinary Science at the School of Agriculture, Cambridge, on being recently awarded the degree of honorary M.A. of that University. This is the first time that a member of our profession has received this honour.

NOTICES.

All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C.2. Telephone : Gerrard 4646. Telegrams : " Baillière Rand, London."

Annual Subscription for the British Empire, 21s. ($4.00) post free ; or combined subscription with the " Veterinary News " (weekly), 35s., post free.

THE BLUE CROSS FUND.
("OUR DUMB FRIENDS' LEAGUE")

PRESIDENT - - - THE RIGHT HON. THE EARL OF LONSDALE.

To alleviate the sufferings of Horses and Dogs in times of Peace and War.

72, VICTORIA STREET, LONDON, S.W.1.

Hon Treasurer: The Lord Lambourne. *Chairman:* Sir Arthur L. Lever, Bart.

WORN-OUT HORSE TRAFFIC CAMPAIGN. AMBULANCES FOR INJURED HORSES IN THE LONDON STREETS. THE CHARLTON KENNELS, SHOOTERS HILL (Soldiers' and Sailors' Dogs quarantined, etc.).

A very urgent appeal is now made for the Blue Cross Fund, which has much useful work to accomplish, particularly in connection with the Campaign against the Continental Traffic in aged and worn-out British Horses.

Cheques payable BLUE CROSS FUND, Head Offices, "Our Dumb Friends' League," 72, Victoria Street, S.W.1.

Write to **I. ISAACS & Co.** ESTABLISHED 100 YEARS.
for all kinds of **MEDICINE BOTTLES.**

THE NORTH LONDON GLASS BOTTLE WORKS.
Head Office :—106, MIDLAND ROAD, LONDON, N.W.1.
Stores :—MIDLAND Ry. GOODS DEPÔT, ST. PANCRAS.